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# Flood risk management and ‘fairness’: aspirations and reality

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**Abstract.** Flood risk management in United Kingdom has been going through a process of rapid change in the last decade or so, no doubt spurred on by a series of very serious floods since the year 2000. These changes affect flood defence and non-structural flood risk management measures alike, and involve a degree of devolution from central government to local communities and regional organisations, as central government seeks to shed responsibilities for policy implementation. This paper discusses three case studies concerning flood defence, property level protection, and flood insurance, set against the framework of “fairness” encapsulated in egalitarian, utilitarian and Rawlsian approaches to social justice. The results show a different pattern in each area, with flood defence moving somewhat towards a Rawlsian approach, but flood insurance and property level protection showing signs of both inefficiency and poor penetration, respectively, particularly with regard to low income residents, especially those in social housing.

## 1 Introduction

Those concerned to manage and hence reduce flood risk commonly have aspirations to be fair, and treat all those at risk and contributing to risk reduction equally in an open and transparent way that maximises social well-being and solidarity, in the face of both risks now and risks into the future. Such aims are often articulated in policy documents, Government statements and through the work of Non-Governmental Organisations. They also involve consideration of relevant populations both during flood events, in the recovery period afterwards, and through the investment of state and private resources targeted at risk reduction measures, both engineering and non-engineering.

In this paper these issues are discussed with regard to three examples. First, we look at investment in traditional flood risk management (FRM) measures in the UK, and the impact they have on deprived and non-deprived communities. This appears to show a marked shift in attention towards the former, and away from the latter, as government investment is targeted at those areas of financial deprivation which are also at flood risk. This is not an absolutely clear picture, because at the same time the government is prioritizing investment in a major scheme to the west of London, the Thames Scheme, where substantial investment has been given without consideration, it would appear, to the social composition of the area and its relative affluence.

Secondly, we looked at flood risk management for those in social housing and the provision of property-level-protection measures. Such measures are unaffordable to those on low incomes in social housing,

yet this is one policy option that is being promulgated widely in the absence of sufficient government funds for major flood risk reduction measures of the traditional kind. Leaving those who are already vulnerable to seek protection from their own resources appears to be a perverse policy, with few chances of significant success.

Thirdly, we look at recovery and insurance that promotes recovery, and a new proposal in the UK to subsidise flood insurance (through the reinsurance arrangement termed Flood Re), even for those occupying very large houses which are worth considerable sums of money. The whole question of subsidising flood insurance is an important one in justice terms, because it means a cross subsidy from those not at risk to those at risk (or from those at low risk to those at high risk), and this has become more transparent recently owing to government policies to make flood insurance affordable and available to anyone, even those at high risk.

## 2 Social justice and ‘fairness’

Within a very large literature on social justice, there are three key influential philosophies demonstrating different outcomes with regard to justice and fairness. Egalitarian philosophy favours equality, seeking to ensure that resources are distributed equally, to provide equal access of opportunity. Egalitarians focus on individual capabilities (e.g. individuals are able to access health services, etc.) to assess whether the system is producing fair opportunities for everyone [1] (i.e. it is procedurally just). As noted by Johnson et al. [2, p.377], an egalitarian FRM policy would “ensure that all those at

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risk of flooding have an equal opportunity of having their flood risk managed by the state".

Rawlsian justice focuses on the institutions that provide services and resources, stating that they have the duty to only allow inequalities if the policy provides the greatest benefit to the least advantaged [3]. For FRM, Rawlsian philosophy would prioritise distributional justice (i.e. a fair distribution of resources, and 'good' and 'bad' outcomes), ensuring that resources are directed to the most vulnerable to flood risk. Utilitarianism philosophy also focuses on the principle of distributional justice. Yet, utilitarian beliefs aim to redistribute societal resources to maximise the potential societal happiness [4], often by using a benefit:cost approach. Utilitarians would promote FRM policies that maximise total utility, and thus are beneficial to the entire country or community involved. A critique of utilitarian beliefs is that maximising utility fails to consider the uneven distribution of needs and thus differentiated vulnerabilities [5]. However, utilitarian thinking would state that as FRM is generally funded in most counties (and certainly in the UK) by all taxpayers and not just those at risk of flooding, the investments should benefit all taxpayers by being efficient [5].

If FRM policies are to be considered equitable or "fair", they will likely exemplify one of the above philosophies of justice. Either by aiming to provide support for everyone (egalitarian), to help the most disadvantaged (Rawlsian), or to maximise returns for the nation as a whole (utilitarian). These three principles provide useful criteria, and will be used below to assess the extent to which certain UK FRM policies and practices can be considered socially just.

### 3 'Partnership Funding' in the UK

For flood risk management in England and Wales, a very significant change to the funding system took place in 2011, against the background of the forecasts of higher risk levels. The change was one to an arrangement promoting local/national cost-sharing from one dominated by central government providing virtually all investment costs in the form of a "block grant" to the Environment Agency (EA). The significance of this change is that it introduced a far greater and critical element of "localism" into what previously was a highly centralised arrangement, and to a change where the likelihood increases of the burden of this investment falling partly on those who would benefit from the associated risk reduction. This highlights a shift from a national solidarity approach to one closer that of beneficiary pays.

The block grant system remains (Figure 1), but risk reducing schemes in many cases can only proceed if the national contribution is complemented by locally derived resources. The new 'Partnership Funding' arrangement [6] operates on a formula basis to determine the Flood Defence Grant in Aid (FDGiA) – how the EA block grant (provided by Defra) is to be allocated, scheme-by-scheme [7]:

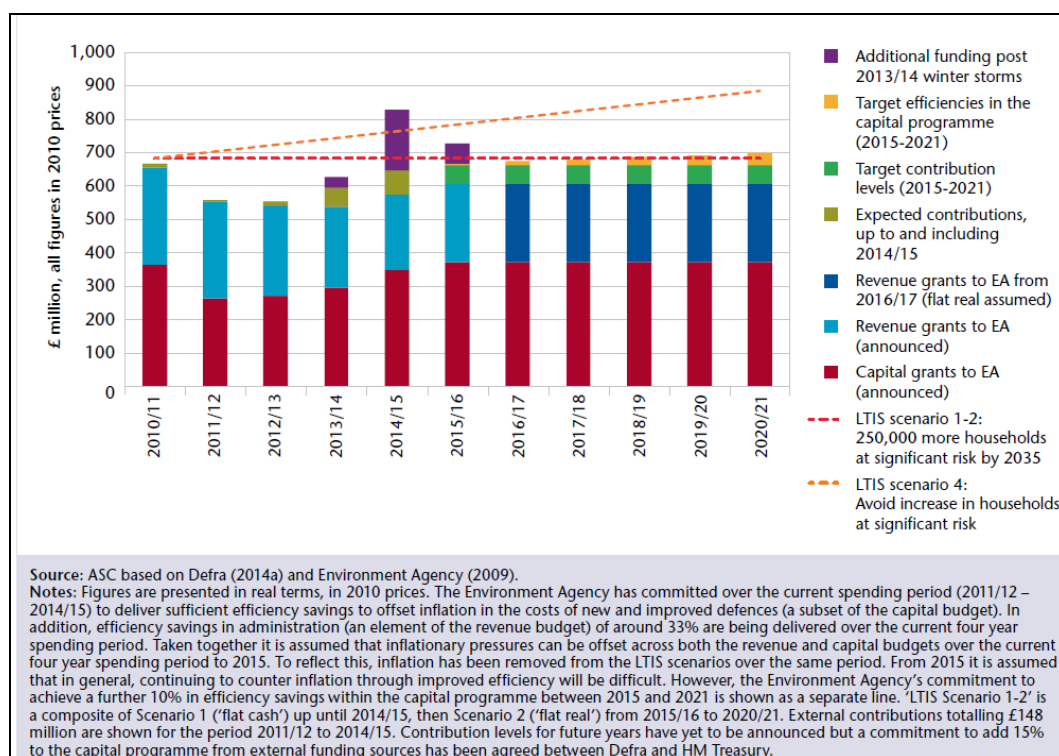
$$£ \text{FDGiA} = H + B + E \quad (1)$$

Where (see Table 1):

H - is the value of qualifying Household benefits for that scheme, times the payment rate

B - is the value of Other Whole-life Benefits for that scheme, times their payment rate

E - is the number of Environmental Outcomes for that scheme, times their payment rates.



**Figure 1.** Current and future spending on flood and coastal defence against the latest assessment of need as published in the Environment Agency's long-term investment strategy [32].

Outcome Measure (OM)	Qualifying outcomes/benefits	Payment rate
OM1	Present value of the whole life benefits of the current proposed investment, less benefits or payments associated with the outcome measures below.	£0.556 per £1.00 of qualifying benefit (i.e. 5.56%)
OM2	The number of households protected against flood risk:	
	In the 20% most deprived areas	£0.45 per £1.00 of benefit
	In the 21% to 40% most deprived areas	£0.30 per £1.00 of benefit
	In the 60% least deprived areas	£0.20 per £1.00 of benefit
OM3	The number of households better protected against coastal erosion	
	In the 20% most deprived areas	£0.45 per £1.00 of benefit
	In the 21% to 40% most deprived areas	£0.30 per £1.00 of benefit
	In the 60% least deprived areas	£0.20 per £1.00 of benefit
OM4	Statutory environmental obligations:	
	Hectares of water-dependent habitat created or protected	£15,000 per hectare
	Hectares of inter-tidal habitat created	£50,000 per hectare
	Kilometres of protected river improved	£80,000 per km of river bed

**Table 1.** The payment rates for the Partnership Funding arrangement (Source: from [6])

From this can be derived an Outcome Measure (OM) Score (as a %) - being the £FDGiA sum from the above formula divided by the scheme costs - and this metric can be used to prioritise decision-making. Many schemes will have an OM value greater than 100%, and then the full cost is available from the grant. In other cases there is a shortfall: the grant fails to cover the costs and the shortfall needs to be met from local contributions if the scheme is to proceed. These contributions can come from a number of sources, with the three prime headings being a small 'local levy' (approximately £30M per annum) collected by the Environment Agency from local authorities, the public (e.g. local authorities directly) and the private sector (e.g. developers or industry).

One of the characteristics of this Partnership Funding is that any scheme delivering worthwhile benefits (as defined in the Defra policy) can receive some level of central government funding, unlike the situation previously where, if the scheme did not warrant proceeding by the rules then extant [8], the central government contribution was zero. To be eligible for a grant the Partnership Funding score (PF) must show that there are sufficient funds available: the PF score must be above 100% (the score broadly is the maximum permitted grant for the scheme plus the local contribution divided by cost of scheme). To receive a grant in a particular year a scheme must be successful in a process that prioritises funding against the PF scores and accommodates local choices. Regarding the latter criterion, a stated objective of Defra's policy here is to enable more local choice in the solutions adopted to reduce flood risk, and Regional Flood and Coastal Committees now play a part in ensuring that local choices are reflected in the programmes that they are now required to agree.

The National Flood and Coastal Erosion Risk Management Strategy summarised the new system in 2011: "In essence, instead of meeting the full cost of a limited number of schemes, a new partnership approach to funding could make government money available to pay a share of any worthwhile scheme. The amount in each case will depend on the level of benefits the scheme provides. For example, the number of households protected, or the amount of damage that can be prevented. The level of government funding potentially available towards each scheme can be easily calculated. Local authorities and communities can then decide on priorities and what to do if full funding is not available. Projects can still go ahead if costs can be reduced or other funding can be found locally" [9].

The real issue here, is whether the overall level of local contributions will be sufficient to meet the requirements from Defra and to fund many of the schemes that local communities wish to have implemented. As Figure 1 shows, the expected level of local contributions is in the order of £75 million per annum, a relatively small sum compared with the total spend on flood risk management, but a relatively large sum for local communities to find, especially since local authorities are having their overall expenditure levels cut significantly. Recently, permission has been given to raise council tax levels to pay for flood risk management schemes, but even this may not be sufficient in areas of significant perceived need. Thus the prospects of the Lower Thames Scheme (cost approximately £250 millions) or the scheme for Oxford (cost approximately £120 millions) generating sufficient local commitment to fund a contribution of the order of £100 millions and £50 millions respectively appears remote.

This is because the Grant-In-Aid Formula advantages areas with significant numbers of deprived households, where the full cost of any scheme there has a good chance of being met from the Grant-In-Aid. Thus Figure 2 shows a tendency for spend to be concentrated in the north of England, where there is a larger proportion of deprived areas than in the south. It is not yet known whether this trend is continuing, but there is some evidence that suggests that it is (personal communication, Dr John Chatterton, February 2016). Given this situation, it would appear that flood defence expenditure is taking on something of a Rawlsian dimension, protecting communities that are vulnerable both in terms of flood risk and personal finances. Whether this was exactly what was intended by the government is open to debate.

#### 4 Flood risk management and housing tenure

A previously overlooked dynamic in FRM is the relationship between flooding and tenure type. The issue here is what makes social housing residents particularly vulnerable to flooding, and the implications of this for creating 'socially just' FRM policies. Most broadly, social housing is affordable accommodation provided in the UK by local Councils or housing associations (HA) to those in need [10]. Vulnerability to flooding is a complex concept to measure, and particularly challenging for social housing. This is because the stock itself differs in size, quality, and type (e.g. semi-detached vs. tower blocks), there are split responsibilities through various ownership structures (e.g. it can be rented, partially bought, or fully bought), and its residents are not homogenous, as each possess various attributes or skills that might increase their ability to deal with flood risk [11; 12; 13].

However, two broad characteristics of social housing units limit the ability of their occupants to engage with the flood risk management policies, in particular the widely advocated policy of encouraging property-level-protection measures (PLP). This policy seeks to transfer the responsibility of flood protection to the residents themselves, for example through their implementation of coping mechanisms (e.g. moving belongings), immediate adaptations (e.g. using sandbags), or future adaptations (e.g. raising the height of the front door threshold) to cope with flood risk [14].

The first characteristic is the lack of autonomy of social housing residents to act. Due to the ownership structures, the maintenance responsibility here is often split between the landlord and the tenant, as it also is of course in the case of private rented accommodation. But the Decent Homes Act provides a standard of conditions for social housing, which is Rawlsian in nature as it directs resources to some of the most deprived households in the UK. The Decent Homes Standard is a technical standard for public housing which underpinned the Decent Homes Programme brought in by the government in 2006 which aimed to provide a minimum standard of housing conditions for all those who are housed in the public sector - i.e. council housing and housing associations. Whilst this provides a standard to

adhere to, it not only fails to account for current or future flood risk [15], it presents unclear directives as to the responsibility, or ability, of tenants to make structural changes to their dwellings, should they wish to carry out additional flood-proofing. This lack of autonomy has implications for a tenant's capacity to undertake these property-level-protection measures to reduce flood risk, firstly in creating apathy for action (i.e. through tenants not knowing, and deferring action to the landlord), and secondly through refusing tenants the right to act (i.e. being obliged to wait for permissions).

Secondly, in comparison to other tenure-types, social housing residents tend to have lower income and education levels, and house both more old and young tenants [16]. Whilst some PLP are costless, others require the purchase of products, and may be less available to low-income households [14]. Furthermore, research indicates that low-income households are less likely to know how to cope with flooding [17].

Whilst a policy stipulating increased tenant responsibility for their flood risk is in theory an effective manner to increased flood preparedness for the UK at a low cost to the government, it is only effective if the tenants themselves engage with this policy. To ask social housing residents who are often the most deprived individuals in the country to engage with this policy, as though they are equally prepared and able to as those who are much more capable and affluent, shows a severe lack of understanding towards the concept of differentiated vulnerability. Given their characteristic limited income and educational levels, and the confused status of autonomy of residents in social housing, it is likely this policy will have limited chance of success.

Transformational adaptations, which are more significant actions like moving housing to avoid the flood risk [18], are unlikely to be supported by the government or by the tenants themselves given the strict allocation criteria for social housing which means that moving to another area can lose the tenants' likelihood of being offered affordable state or housing association promoted housing.

#### 5 Flood insurance post 2016 in the UK

Flood insurance is near universal in the UK, provided by private companies [19]. But from April 2016 the UK adopted a new 'pooling' approach. Flood Re, implemented into UK law by the Water Act 2014 [20] and additional Regulations [21], has the aim of promoting the continued availability and affordability of insurance premiums in flood risk areas. Flood Re applies a (graduated) premium cap to household policies thereby limiting the amount paid by an individual for flood insurance. Insurers then cede these policies into the Flood Re scheme and any flood losses that occur are paid from the industry-wide pool. The £180m annual funding for the pool is generated from the premium income of those properties entered and also from a levy which is included on all domestic flood insurance policies, which are now formally subsidising the insurance of properties in high flood risk areas. Flood Re is only meant to be in place

for the next 25 years, supposedly to give both the government and households time to reduce flood risk. Over this period, it is proposed that the capped premiums will increase, thereby phasing out the cross-subsidy and returning flood insurance to a purely market based situation [22].

Flood Re raises a number of social justice issues. The first relates to which properties are eligible. Only private households are included [23]; businesses are not included, nor landlords with multiple properties, so that most leasehold properties are excluded. New properties built after 1st January 2009 are also excluded, to recognise that a critical component of UK FRM is to prevent the increase of flood risk. But problems relating to flood risk awareness and disclosure may mean the burden is passed to unsuspecting homeowners, rather than remaining with developers, who retain no liability.

Maintaining the affordability (and availability) of flood insurance appears to be a positive step, but there is the question of who benefits. Flood Re is specifically designed to assist those householders with high premiums for flood cover and as such it is only these households in higher risk areas that benefit: those at higher flood risk are being subsidised by those at low or no flood risk. Although this situation did exist prior to the scheme's implementation, Flood Re has formalised this relationship and Penning-Rowsell and Pardoe [24] raise questions about the fairness of the approach.

Within the approach there is little consideration of the ability to pay for flood insurance as a criterion for receiving premium assistance. The way in which Flood Re caps premiums and distributes the risk amongst all policyholders means that low income households who are not at risk are cross-subsidising high income, at-risk households who could very probably afford the risk-reflective price. The capped premiums do show some graduation according to Council Tax property value "Bands" (i.e. value ranges) and those residents in lower value properties pay less for their insurance than those in more expensive properties. Low value "Band A" properties would pay £210 towards the flood component of a combined flood policy, whereas a mid-value "Band E" property has a premium cap of £330. This is acting as very crude proxy for whether a property owner may be able to afford to pay. However, this graduation is in part related to the additional cover required by more expensive larger properties: any claims will be higher. Original plans for Flood Re excluded the most expensive 1% of properties ("Band H"), recognising that these occupants should not be subsidised [25]. However, the scheme as implemented did include these properties, although the capped premium is more than double the next lowest band at £1200 [26, 27], but it would be considerably higher without the subsidy. Furthermore, Flood Re does nothing to address the wider issues of affordability of insurance and there has not been the inclusion of any mechanism to enable those who are not able to afford any kind of insurance to access flood cover.

A counter to these social justice concerns is that Flood Re is only intended to be a transitional arrangement and that over time this cross-subsidy will be removed, at least for the higher value properties. However, the first

transitional plan [22] provides few details about how the removal of the cross-subsidy will work in practice. For instance, unless flood premiums are able to be lowered due to risk reduction measures it is likely that affordability will remain a key issue and may lead to a reduction in insurance penetration. Additionally, as indicated above, those on lower incomes are less likely to be able to afford to take proactive PLP measures to adopt risk reduction measures, as well as being less likely to be able to afford higher premiums with the transition to risk-related premiums [28, 29]. Therefore, unless there is government intervention either better to enable disadvantaged households to adopt flood mitigation, or the cross-subsidy continues for these low income households after the proposed end of the scheme, it is likely that greater numbers of properties will become uninsured in the future, occupied by those less able to afford to recover from flooding.

## 6 Assessment and conclusions

The last decade has seen very significant changes in flood risk management policy in the UK [30]. Many of these changes have been directly or indirectly a result of severe flooding in 2000, 2007, 2013/14 and 2015/16. Policy changes have affected both the non-structural and the structural dimensions of flood risk management measures, as the government and other stakeholders have seen the necessity to react to a change in flood risk regime and to a financial state of affairs whereby governments are seeking to restrain their expenditure in this area, given the reluctance to raise taxes and extreme budgetary pressures elsewhere, for example from the health sector.

The essence of the changes flood risk management policy has been to devolve responsibility to local and regional actors, including individual households, rather than central government being the prime mover for risk reduction.

There are some contradictory elements with regard to social justice and fairness in this respect, as characterised by our three examples discussed above. Flood defence expenditure appears to be moving towards quite an implicit Rawlsian approach, at least in part, giving a distinct advantage to protecting householders in financially deprived areas and making the implementation of large flood risk management measures in more affluent areas difficult to fund.

On the other hand property level protection measures undertaken by individuals in social housing - also characteristic of socially and economically deprived locations - appears to be completely neglected, thus adding to the vulnerability of the occupants and restricting their ability to recover from flood events.

At the same time, the new Flood Re proposals for flood insurance continue to subsidise for the next 25 years those householders living in floodplain areas, including subsidising those almost certainly well able to afford market prices for the premiums they pay for the cover provided. The scheme also appears to continue to create a distinct disincentive for individual householders



who have their insurance subsidised in this way to reduce the risk they face by taking some actions themselves.

Both the social housing and the flood insurance situations are distinctly non-Rawlsian in character, but nor are they egalitarian, nor necessarily utilitarian. Indeed, the flood insurance proposals cannot be seen as utilitarian since they are not characterised by the search for efficiency that that philosophy espouses: the latest assessment of Flood-Re suggests that its net present value is negative [31, 32]! The most charitable view of the situation with regard to social housing is that it has not been considered a significant flood risk management issue in the past, rather than the situation being deliberately designed to penalize those living in such locations. Whilst we recognise that flooding itself is not “fair”, since it affects only a small proportion of the population [2], movements in the policy arena that exacerbate rather than minimise unfairness would not seem to be a sustainable or sensible way forward.

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